=> index bioscience medicine

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=> s (n-acylhomoserine(s)lactone(s)acylase#) or (acylhomoserine(s)lactone(s)acylase#) or (AHL(s)acylase#) or AiiA or (acylhomoserine(s)lactone(s)lactonase#) or (AHL(s)lactonase#)
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3 FILE WPINDEX
4 FILE IPA
208 FILE NLDB

L1 QUE (N-ACYLHOMOSERINE(S) LACTONE(S) ACYLASE#) OR (ACYLHOMOSERINE(S) LACTONE(S) ACYLASE#) OR (AHL(S) ACYLASE#) OR AIIA OR (ACYLHOMOSERINE(S) LACTONE(S) LACTONASE#) OR (AHL(S) LACTONASE#)

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F40 1 FSTA
F41 1 IMSDRUGNEWS
F42 1 IMSRESEARCH
F43 1 PHIC

=> file f1-f7, f11, f13, f14, f15, f20,f8
=> s L1
L2 976 L1

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L5 20 DUP REM L4 (33 DUPLICATES REMOVED)

=> d ibib abs l5 1-20

L5 ANSWER 1 OF 20 USPATFULL on STN
ACCESSION NUMBER: 2005:179006 USPATFULL
TITLE: Ralstonia ahl-acylase gene
INVENTOR(S): Zhang, Lian Hui, Singapore, SINGAPORE
Xu, Jin Ling, Singapore, SINGAPORE
Lin, Yi Han, Singapore, SINGAPORE

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005155088	A1	20050714
APPLICATION INFO.:	US 2003-502351	A1	20020123 (10)
	WO 2002-SG11		20020123

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: ROTHWELL, FIGG, ERNST & MANBECK, P.C., 1425 K STREET, N.W., SUITE 800, WASHINGTON, DC, 20005, US
NUMBER OF CLAIMS: 17
EXEMPLARY CLAIM: 1

NUMBER OF DRAWINGS: 2 Drawing Page(s)
LINE COUNT: 1379
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention provides a gene, qsbA, which encodes a protein useful for inactivating certain bacterial quorum-sensing signal molecules (N-acyl homoserine lactones) which participate in bacterial virulence and biofilm differentiation pathways. This gene was isolated from Ralstonia sp., strain XJ12B. The invention also provides the QsbA protein, which possesses N-acyl homoserine lactone inactivating activity.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 2 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN
ACCESSION NUMBER: 2005133883 ESBIOBASE
TITLE: The quorum-quenching lactonase from Bacillus thuringiensis is a metalloprotein
AUTHOR: Thomas P.W.; Stone E.M.; Costello A.L.; Tierney D.L.; Fast W.
CORPORATE SOURCE: W. Fast, College of Pharmacy, University of Texas at Austin, 1 University Station, A1935, Austin, TX 78712, United States.
E-mail: WaltFast@mail.utexas.edu
SOURCE: Biochemistry, (24 MAY 2005), 44/20 (7559-7569), 49 reference(s)
CODEN: BICHAW ISSN: 0006-2960
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AB ***Lactonases*** from Bacillus species ***hydrolyze*** the N-***acylhomoserine*** ***lactone*** (***AHL***) signaling molecules used in quorum-sensing pathways of many Gram-negative bacteria, including Pseudomonas aeruginosa and Erwinia carotovora, both significant pathogens. Because of ***sequence*** similarity, these ***AHL*** ***lactonases*** have been assigned to the metallo-.beta.-lactamase superfamily of proteins, which includes metalloenzymes of diverse activity, mechanism, and metal content. However, a recent study claims that ***AHL*** ***lactonase*** from Bacillus sp. 240B1 is not a metalloprotein [Wang, L. H., et al. (2004) J. Biol. Chem. 279, 13645]. Here, the ***gene*** for an ***AHL*** ***lactonase*** from Bacillus thuringiensis is ***cloned*** , and the protein is expressed, purified, and found to bind 2 equiv of zinc. The metal-bound form of ***AHL*** ***lactonase*** catalyzes the ***hydrolysis*** of N-hexanoyl-(S)-homoserine ***lactone*** but not the (R) enantiomer. Removal of both zinc ions results in loss of activity, and reconstitution with zinc restores activity, indicating the importance of metal ions for catalytic activity. Metal content, ***sequence*** alignments, and X-ray absorption spectroscopy of the zinc-containing ***lactonase*** all support a proposed dinuclear zinc binding site similar to that found in glyoxalase II. .COPYRGT. 2005 American Chemical Society.

L5 ANSWER 3 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN
ACCESSION NUMBER: 2005171460 ESBIOBASE
TITLE: Quorum quenching enzyme activity is widely conserved in the sera of mammalian species
AUTHOR: Yang F.; Wang L.-H.; Wang J.; Dong Y.-H.; Jiang Y.H.; Zhang L.-H.
CORPORATE SOURCE: Y.H. Jiang, Center for Water Research, Department of Civil Engineering, National University of Singapore, 10 Kent Ridge Crescent, Singapore 119260, Singapore.
E-mail: lianhui@imcb.a-star.edu.sg
SOURCE: FEBS Letters, (27 JUL 2005), 579/17 (3713-3717), 32 reference(s)
CODEN: FEBLAL ISSN: 0014-5793
PUBLISHER ITEM IDENT.: S001457930500685X
DOCUMENT TYPE: Journal; Article
COUNTRY: Netherlands
LANGUAGE: English

SUMMARY LANGUAGE: English
AB Acyl-homoserine lactone (***AHL***) quorum sensing signals play a key role in synchronizing virulence ***gene*** expression in Pseudomonas aeruginosa, which could cause fatal bloodstream infections. We showed that ***AHL*** ***inactivation*** activity, albeit with variable efficiency, was conserved in the serum samples of all the 6 tested mammalian animals. High-performance liquid chromatography and mass spectrometry analyses revealed that mammalian sera had a ***lactonase*** -like enzyme(s), which ***hydrolyzed*** the lactone ring of ***AHL*** to produce acyl homoserine, with enzyme properties reminiscent of paraoxonases (PONs). We further showed that the animal cell lines expressing three mouse PON ***genes*** , respectively, displayed strong ***AHL*** degradation activities.

L5 ANSWER 4 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 2005125601 ESBIOBASE
TITLE: Identification of extracellular N-acylhomoserine lactone acylase from a Streptomyces sp. and its application to quorum quenching
AUTHOR: Park S.-Y.; Kang H.-O.; Jang H.-S.; Lee J.-K.; Koo B.-T.; Yum D.-Y.
CORPORATE SOURCE: D.-Y. Yum, R and D Center, INBIONET Corporation, Daejeon 305-390, South Korea.
E-mail: dyyum@inbionet.com
SOURCE: Applied and Environmental Microbiology, (2005), 71/5 (2632-2641), 41 reference(s)
CODEN: AEMIDF ISSN: 0099-2240
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AB ***N*** - ***Acylhomoserine*** lactones (AHLs) play an important role in regulating virulence factors in pathogenic bacteria. Recently, the enzymatic ***inactivation*** of AHLs, which can be used as antibacterial targets, has been identified in several soil bacteria. In this study, strain M664, identified as a Streptomyces sp., was found to secrete an ***AHL*** -degrading enzyme into a culture medium. The ahlM ***gene*** for ***AHL*** degradation from Streptomyces sp. strain M664 was ***cloned*** , expressed heterologously in Streptomyces lividans, and purified. The enzyme was found to be a heterodimeric protein with subunits of approximately 60 kDa and 23 kDa. A comparison of AhlM with known ***AHL*** - ***acylases*** , Ralstonia strain XJ12B AiiD and Pseudomonas aeruginosa PAO1 PvdQ, revealed 35% and 32% identities in the deduced amino acid ***sequences*** , respectively. However, AhlM was most similar to the cyclic lipopeptide ***acylase*** from Streptomyces sp. strain FERM BP-5809, exhibiting 93% identity. A mass spectrometry analysis demonstrated that AhlM ***hydrolyzed*** the amide bond of ***AHL*** , releasing homoserine ***lactone*** . AhlM exhibited a higher deacylation activity toward AHLs with long acyl chains rather than short acyl chains. Interestingly, AhlM was also found to be capable of degrading penicillin G by deacylation, showing that AhlM has a broad substrate specificity. The addition of AhlM to the growth medium reduced the accumulation of AHLs and decreased the production of virulence factors, including elastase, total protease, and LasA, in P. aeruginosa. Accordingly, these results suggest that ***AHL*** - ***acylase*** , AhlM could be effectively applied to the control of ***AHL*** -mediated pathogenicity.

L5 ANSWER 5 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 2
ACCESSION NUMBER: 2005:170657 CAPLUS
TITLE: Disruption of quorum sensing in seawater abolishes attraction of zoospores of the green alga Ulva to bacterial biofilms
AUTHOR(S): Tait, Karen; Joint, Ian; Daykin, Mavis; Milton, Debra L.; Williams, Paul; Camara, Miguel
CORPORATE SOURCE: Plymouth Marine Laboratory, Plymouth, PL1 3DH, UK

SOURCE: Environmental Microbiology (2005), 7(2), 229-240
CODEN: ENMIFM; ISSN: 1462-2912
PUBLISHER: Blackwell Publishing Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Zoospores of the eukaryotic green seaweed Ulva respond to bacterial N-acylhomoserine lactone (AHL) quorum sensing signal mols. for the selection of surface sites for permanent attachment. In this study we have investigated the prodn. and destruction of AHLs in biofilms of the AHL-producing marine bacterium, Vibrio anguillarum and their stability in seawater. While wild type V. anguillarum NB10 was a strong attractor of zoospores, ***inactivation*** of ***AHL*** prodn. in this strain by either expressing the ***recombinant*** Bacillus ***lactonase*** coding ***gene*** ***aiiA*** , or by mutating the ***AHL*** biosynthetic ***genes*** , resulted in the abolition of zoospore attraction. In seawater, with a pH of 8.2, the degrdn. of AHL mols. was temp.-dependent, indicating that the AHLs produced by marine bacterial biofilms have short half-lives. The Ulva zoospores sensed a range of different AHL mols. and in particular more zoospores settled on surfaces releasing AHLs with longer (>six carbons) N-linked acyl chains. However, this finding is likely to be influenced by the differential diffusion rates of AHLs from the exptl. surface matrix. Mols. with longer N-acyl chains, such as N-(3-oxodecanoyl)-L-homoserine lactone, diffused more slowly than those with shorter N-acyl chains such as N-(3-hydroxy-hexanoyl)-L-homoserine lactone. Image anal. using GFP-tagged V. anguillarum biofilms revealed that spores settle directly on bacterial cells and in particular on microcolonies which we show are sites of concd. AHL prodn.
REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 6 OF 20 USPATFULL on STN
ACCESSION NUMBER: 2004:180323 USPATFULL
TITLE: Control of bacterial infection by quenching quorum-sensing of plant pathogenic bacteria
INVENTOR(S): Zhang, Lianhui, Singapore, SINGAPORE
Dong, Yihu, Singapore, SINGAPORE
Xu, Junling, Singapore, SINGAPORE
Zhang, Xifen, Singapore, SINGAPORE

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004139495	A1	20040715
APPLICATION INFO.:	US 2004-470294	A1	20040120 (10)
	WO 2001-SG12		20010129

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: ROTHWELL, FIGG, ERNST & MANBECK, P.C., 1425 K STREET, N.W., SUITE 800, WASHINGTON, DC, 20005
NUMBER OF CLAIMS: 16
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 5 Drawing Page(s)
LINE COUNT: 741
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Transgenic plants, protected from bacterial pathogens, which harbor the ***aiiA*** ***gene*** or a functional fragment or a modification thereof and express functional ***AiiA*** protein were produced. The plants and plant materials of this invention ***inactivate*** bacterial pathogen quorum-sensing signal molecules, thereby eliminating or reducing the production of bacterial virulence factors which are harmful to plant cells and tissues.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 7 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 2004100092 ESBIOBASE
TITLE: Specificity and Enzyme Kinetics of the Quorum-quenching N-Acyl Homoserine Lactone Lactonase (AHL-lactonase)

AUTHOR: Wang L.-H.; Weng L.-X.; Dong Y.-H.; Zhang L.-H.
CORPORATE SOURCE: L.-H. Zhang, Inst. of Molecular and Cell Biology, 30 Medical Drive, Singapore 117609, Singapore.
E-mail: lianhui@imcb.nus.edu.sg
SOURCE: Journal of Biological Chemistry, (02 APR 2004), 279/14 (13645-13651), 41 reference(s)
CODEN: JBCHA3 ISSN: 0021-9258
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AB N-Acyl homoserine lactone (***AHL***) quorum-sensing signals are the vital elements of bacterial quorum-sensing systems, which regulate diverse biological functions, including virulence. The ***AHL*** - ***lactonase*** , a quorum-quenching enzyme encoded by ***aiiA*** from Bacillus sp., ***inactivates*** AHLs by ***hydrolyzing*** the lactone bond to produce corresponding N-acyl homoserines. To characterize the enzyme, the ***recombinant*** ***AHL*** - ***lactonase*** and its four variants were purified. Kinetic and substrate specificity analysis showed that ***AHL*** - ***lactonase*** had no or little residue activity to non-acyl lactones and noncyclic esters, but displayed strong enzyme activity toward all tested AHLs, varying in length and nature of the substitution at the C3 position of the acyl chain. The data also indicate that the amide group and the ketone at the C1 position of the acyl chain of AHLs could be important structural features in enzyme-substrate interaction. Surprisingly, although carrying a .sup.1.sup.0.sup.4HX-HXDH.sup.1.sup.0.sup.9 short ***sequence*** identical to the zinc-binding motif of several groups of metallohydrolytic enzymes, ***AHL*** - ***lactonase*** does not contain or require zinc or other metal ions for enzyme activity. Except for the amino acid residue His-104, which was shown previously to not be required for catalysis, kinetic study and conformational analysis using circular dichroism spectrometry showed that substitution of the other key residues in the motif (His-106, Asp-108, and His-109), as well as His-169 with serine, respectively, caused conformational changes and significant loss of enzyme activity. We conclude that ***AHL*** - ***lactonase*** is a highly specific enzyme and that the .sup.1.sup.0.sup.6HXDH.sup.1.sup.0.sup.9.apprx. H.sup.1.sup.6.sup.9 of ***AHL*** - ***lactonase*** represents a novel catalytic motif, which does not rely on zinc or other metal ions for activity.

L5 ANSWER 8 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2005:288141 CAPLUS
TITLE: Activity of Bacillus thuringiensis AiiA protein against soft rot disease for Amorphophallus konjac caused by Erwinia. carotovora pv. carotovora
AUTHOR(S): Zhou, Yi; Sun, Ming; Yu, Zi-niu
CORPORATE SOURCE: College of Life Science and Technology, Huazhong Agricultural University/The National Key Laboratory of Agricultural Microbiology, Wuhan, Hubei, 430070, Peop. Rep. China
SOURCE: Wuhan Daxue Xuebao, Lixueban (2004), 50(6), 761-764
CODEN: WDXLA5; ISSN: 1671-8836
PUBLISHER: Wuhan Daxue Qikanshe
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
AB ***AiiA*** protein, blocking the bacterial quorum sensing by ***hydrolyzing*** AHL-lactone, can greatly attenuate the disease caused by many bacterial pathogens in which quorum sensing regulate the expression of virulence ***genes*** . The primers were designed from the sequence of aiiA gene in genome of B. cereus ATCC14579, and the 753 bp long gene segment was amplified from Bacillus thuringiensis by PCR using EX-Taq DNA polymerase. The comparability of aiiA gene from B. thuringiensis is very high with others. The PCR segment was inserted into expression vector pET28a(+). Then the recombinant vector pETAiiA was introduced into E. coli BL21 (DE3) for expression. SDS-PAGE showed that the expression product was a band of about 28 .times. 103 protein. The expression protein greatly attenuated the pathogenesis of E. carotovora pv. carotovora CZY which can result in soft rot for Amorphophallus konjac.

L5 ANSWER 9 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:656906 CAPLUS
DOCUMENT NUMBER: 139:193619
TITLE: Cloning, characterization and sequence of Ralstonia AHL acylase and use for treatment of bacterial infection in mammals and plants
INVENTOR(S): Zhang, Lian Hui; Lin, Yi Han; Xu, Jin Ling
PATENT ASSIGNEE(S): Institute of Molecular Agrobiology, Singapore
SOURCE: PCT Int. Appl., 51 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003068951	A1	20030821	WO 2002-SG11	20020123
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1470221	A1	20041027	EP 2002-715955	20020123
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2005155088	A1	20050714	US 2003-502351	20020123

PRIORITY APPLN. INFO.: WO 2002-SG11 W 20020123
AB This invention provides a gene, qsbA, which encodes a protein useful for inactivating certain bacterial quorum sensing signal mols. (N-acylhomoserine lactones) which participate in bacterial virulence and biofilm differentiation pathways. This N-acylhomoserine lactone acylase gene was isolated from Ralstonia sp., strain XJ12B. The nucleotide sequence of the gene qsbA and the amino acid sequence of the encoded N-acylhomoserine lactone acylase are provided. The gene and enzyme of the invention are useful in controlling bacterial infections in mammals and plants.
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 10 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 2003256913 ESBIOBASE
TITLE: Utilization of Acyl-Homoserine Lactone Quorum Signals for Growth by a Soil Pseudomonad and Pseudomonas aeruginosa PAO1
AUTHOR: Huang J.J.; Han J.-I.; Zhang L.-H.; Leadbetter J.R.
CORPORATE SOURCE: J.R. Leadbetter, W. M. Keck Laboratories, M/C 138-78, California Institute of Technology, Pasadena, CA 91125, United States.
E-mail: jleadbetter@caltech.edu
SOURCE: Applied and Environmental Microbiology, (2003), 69/10 (5941-5949), 46 reference(s)
CODEN: AEMIDF ISSN: 0099-2240
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Acyl-homoserine lactones (AHLs) are employed by several Proteobacteria as quorum-sensing signals. Past studies have established that these compounds are subject to biochemical decay and can be used as growth nutrients. Here we describe the isolation of a soil bacterium, Pseudomonas strain PAI-A, that degrades 3-oxododecanoyl-homoserine lactone (3OC12HSL) and other long-acyl, but not short-acyl, AHLs as sole

energy sources for growth. The small-subunit rRNA ***gene*** from strain PAI-A was 98.4% identical to that of Pseudomonas aeruginosa, but the soil isolate did not produce obvious pigments or AHLs or grow under denitrifying conditions or at 42.degree.C. The quorum-sensing bacterium P. aeruginosa, which produces both 3OC12HSL and C4HSL, was examined for the ability to utilize AHLs for growth. It did so with a specificity similar to that of strain PAI-A, i.e., degrading long-acyl but not short-acyl AHLs. In contrast to the growth observed with strain PAI-A, P. aeruginosa strain PAO1 growth on AHLs commenced only after extremely long lag phases. Liquid-chromatography-atmospheric pressure chemical ionization-mass spectrometry analyses indicate that strain PAO1 degrades long-acyl AHLs via an ***AHL*** ***acylase*** and a homoserine-generating HSL ***lactonase*** . A P. aeruginosa ***gene*** , pvdQ (PA2385), has previously been identified as being a homologue of the ***AHL*** ***acylase*** described as occurring in a Ralstonia species. Escherichia coli expressing pvdQ catalyzed the rapid ***inactivation*** of long-acyl AHLs and the release of HSL. P. aeruginosa engineered to constitutively express pvdQ did not accumulate its 3OC12HSL quorum signal when grown in rich media. However, pvdQ knockout mutants of P. aeruginosa were still able to grow by utilizing 3OC12HSL. To our knowledge, this is the first report of the degradation of AHLs by pseudomonads or other .gamma.-Proteobacteria, of ***AHL*** ***acylase*** activity in a quorum-sensing bacterium, of HSL ***lactonase*** activity in any bacterium, and of ***AHL*** degradation with specificity only towards AHLs with long side chains.

L5 ANSWER 11 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 2003158770 ESBIOBASE
TITLE: AhlD, an N-acylhomoserine lactonase in Arthrobacter sp., and predicted homologues in other bacteria
AUTHOR: Park S.-Y.; Lee S.J.; Oh T.-K.; Oh J.-W.; Koo B.-T.; Yum D.-Y.; Lee J.-K.
CORPORATE SOURCE: D.-Y. Yum, R/D Center, inBioNET Corporation, Daejeon 305-390, South Korea.
E-mail: dyyum@inbionet.com
SOURCE: Microbiology, (01 JUN 2003), 149/6 (1541-1550), 36 reference(s)
CODEN: MROBEO ISSN: 1350-0872
DOCUMENT TYPE: Journal; Article
COUNTRY: United Kingdom
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Quorum sensing is a signalling mechanism that controls diverse biological functions, including virulence, via N- ***acylhomoserine*** ***lactone*** (***AHL***) signal molecules in Gram-negative bacteria. With the aim of isolating strains or enzymes capable of blocking quorum sensing by ***inactivating*** ***AHL*** , bacteria were screened for ***AHL*** degradation by their ability to utilize N-3-oxohexanoyl-L-homoserine ***lactone*** (OHHL) as the sole carbon source. Among four isolates, strain IBN110, identified as Arthrobacter sp., was found to grow rapidly on OHHL, and to degrade various AHLs with different lengths and acyl side-chain substitutions. Co-culture of Arthrobacter sp. IBN110 and the plant pathogen Erwinia carotovora significantly reduced both the ***AHL*** amount and pectate lyase activity in co-culture medium, suggesting the possibility of applying Arthrobacter sp. IBN110 in the control of ***AHL*** -producing pathogenic bacteria. The ahlD ***gene*** from Arthrobacter sp. IBN110 encoding the enzyme catalysing ***AHL*** degradation was ***cloned*** , and found to encode a protein of 273 amino acids. A mass spectrometry analysis showed that AhlD probably ***hydrolyses*** the ***lactone*** ring of N-3-hexanoyl-L-homoserine ***lactone*** , indicating that AhlD is an N- ***acylhomoserine*** ***lactonase*** (AHLase). A comparison of AhlD with other known ***AHL*** -degrading enzymes, Bacillus sp. 240B1 ***AiiA*** , a Bacillus thuringiensis subsp. kyushuensis ***AiiA*** homologue and Agrobacterium tumefaciens AttM, revealed 25, 26 and 21% overall identities, respectively, in the deduced amino acid ***sequences*** . Although these identities were relatively low, the HXDH.apprxeq.H.apprxeq.D motif was conserved in all the AHLasess, suggesting that this motif is essential for AHLase

activity. From a genome database search based on the conserved motif, putative AhlD-like ***lactonase*** ***genes*** were found in several other bacteria, and ***AHL*** -degrading activities were observed in Klebsiella pneumoniae and Bacillus stearothermophilus. Furthermore, it was verified that ahlK, an ahlD homologue, encodes an ***AHL*** -degrading enzyme in K. pneumoniae. Accordingly, the current results suggest the possibility that AhlD-like AHLases could exist in many other micro-organisms.

L5 ANSWER 12 OF 20 LIFESCI COPYRIGHT 2005 CSA on STN
ACCESSION NUMBER: 2003:39421 LIFESCI
TITLE: Acyl-homoserine lactone acylase from Ralstonia strain XJ12B represents a novel and potent class of quorum-quenching enzymes
AUTHOR: Lin, Y.; Xu, J.; Hu, J.; Wang, L.; Ong, S.L.; Leadbetter, J.R.; Zhang, L.
CORPORATE SOURCE: Laboratory of Biosignals and Bioengineering, Institute of Molecular and Cell Biology, and Department of Civil Engineering, National University of Singapore, 30 Medical Drive, Singapore 117609.; E-mail: lianhui@imcb.a-star.edu.sg
SOURCE: Molecular Microbiology [Mol. Microbiol.], (20030200) vol. 47, no. 3, pp. 849-860.
ISSN: 0950-382X.
DOCUMENT TYPE: Journal
FILE SEGMENT: J
LANGUAGE: English
SUMMARY LANGUAGE: English
AB ***N*** - ***acylhomoserine*** lactones (AHLs) are used as signal molecules by many quorum-sensing Proteobacteria. Diverse plant and animal pathogens use AHLs to regulate infection and virulence functions. These signals are subject to biological ***inactivation*** by ***AHL*** - ***lactonases*** and ***AHL*** - ***acylases*** . Previously, little was known about the molecular details underlying the latter mechanism. An ***AHL*** signal- ***inactivating*** bacterium, identified as a Ralstonia sp., was isolated from a mixed-species biofilm. The signal ***inactivation*** encoding ***gene*** from this organism, which we call aiiD, was ***cloned*** and successfully expressed in Escherichia coli and ***inactivated*** three AHLs tested. The predicted 794-amino-acid polypeptide was most similar to the aculeacin A ***acylase*** (AAC) from Actinoplanes utahensis and also shared significant similarities with cephalosporin ***acylases*** and other N-terminal (Ntn) ***hydrolases*** . However, the most similar homologues of AiiD are deduced proteins of undemonstrated function from available Ralstonia, Deinococcus and Pseudomonas genomes. LC-MS analyses demonstrated that AiiD ***hydrolyses*** the ***AHL*** amide, releasing homoserine ***lactone*** and the corresponding fatty acid. Expression of AiiD in Pseudomonas aeruginosa PAO1 quenched quorum sensing by this bacterium, decreasing its ability to swarm, produce elastase and pyocyanin and to paralyse nematodes. Thus, ***AHL*** - ***acylases*** have fundamental implications and hold biotechnological promise in quenching quorum sensing.

L5 ANSWER 13 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 6
ACCESSION NUMBER: 2004:1006259 CAPLUS
DOCUMENT NUMBER: 143:91665
TITLE: Expression of gene aiiA carrying the promoter of gene cry3Aa in Bacillus thuringiensis
AUTHOR(S): Zhu, Chenguang; Sun, Ming; Yu, Ziniu
CORPORATE SOURCE: Key Laboratory of Agricultural Microbiology of Ministry of Education and Agriculture, College of Life Science and Technology, Huazhong Agricultural University, Wuhan, 430070, Peop. Rep. China
SOURCE: Shengwu Gongcheng Xuebao (2003), 19(4), 397-401
CODEN: SGXUED; ISSN: 1000-3061
PUBLISHER: Kexue Chubanshe
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
AB The Bacillus thuringiensis ***recombinant*** strain was constructed for high expression of ***AiiA*** protein (Aii = autoinducer

inactivity). The promoter of insecticidal crystal protein coding gene cry3Aa of B. thuringiensis, a non-sporulation promoter that can promote the transcription earlier and longer than the promoters of other cry genes, was selected. The promoter of AiiA protein coding gene aiiA was replaced with the promoter of gene cry3Aa by overlapping PCR to form the fusion gene pro3A-aiiA. The gene pro3A-aiiA was inserted into shuttle vector pHT304 at site BamH I/Sph I to form recombinant plasmid pBMB686. The plasmid pBMB686 was introduced into B. thuringiensis acrystalliferous strain BMB171, and the recombinant strain BMB686 had a higher and more stable expression level of protein AiiA compared with the parental strain BMB171. The strain BMB686 exhibited stronger ability of N-acyl-homoserine lactones (AHLs) inactivation and much more effective restraint to the potato's soft rot disease caused by Erwinia carotovora than those of the parental strain BMB171. The results showed that the B. thuringiensis strain harvesting the fusion gene pro3A-aiiA may be used in the future to control bacterial diseases which are mediated by the AHL quorum-sensing signals.

L5 ANSWER 14 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 7
ACCESSION NUMBER: 2002:595023 CAPLUS
DOCUMENT NUMBER: 137:152497
TITLE: Method for controlling pathogenic bacterial quorum-sensing by aiiA gene expression in transgenic tobacco and potato plants
INVENTOR(S): Zhang, Lianhui; Dong, Yihu; Xu, Jinling; Zhang, Xifen
PATENT ASSIGNEE(S): Institute of Molecular Agrobiology, Singapore
SOURCE: PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002061099	A1	20020808	WO 2001-SG12	20010129
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1358340	A1	20031105	EP 2001-906508	20010129
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2004139495	A1	20040715	US 2004-470294	20040120

PRIORITY APPLN. INFO.: WO 2001-SG12 W 20010129
AB Transgenic plants, protected from bacterial pathogens which harbor the ***aiiA*** ***gene*** or a functional fragment or modification thereof and express functional ***AiiA*** protein (autoinducer ***inactivation*** protein) were produced. The plants and plant materials of this invention inactivate bacterial pathogen quorum-sensing signal mols., thereby eliminating or reducing the prodn. of bacterial virulence factors which are harmful to plant cells and tissues.
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 15 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 2002083497 ESBIOBASE
TITLE: Genetic control of quorum-sensing signal turnover in Agrobacterium tumefaciens
AUTHOR: Zhang H.-B.; Wang L.-H.; Zhang L.-H.
CORPORATE SOURCE: L.-H. Zhang, Laboratory of Biosignals and Bioeng., Institute of Molecular Agrobiology, National University of Singapore, 1 Research Link, Singapore 117604, Singapore.

E-mail: lianhui@ima.org.sg
SOURCE: Proceedings of the National Academy of Sciences of the United States of America, (02 APR 2002), 99/7 (4638-4643), 41 reference(s)
CODEN: PNASA6 ISSN: 0027-8424
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AB A signal turnover system is an essential component of many genetic regulatory mechanisms. The best-known example is the ubiquitin-dependent protein degradation system that exists in many organisms. We found that Agrobacterium tumefaciens adopts a unique signal turnover system to control exiting from a quorum-sensing mode. A. tumefaciens regulates Ti plasmid conjugal transfer by a quorum-sensing signal, N-3-oxo-octanoyl homoserine ***lactone*** (3OC8HSL), also known as Agrobacterium autoinducer. By using Tn5 mutagenesis and a functional cloning approach, we identified two ***genes*** that are involved in switching from a conjugal quorum-sensing mode to a nonconjugal mode at the onset of stationary phase. First, we located attJ, which codes for an IclR-type suppressor that regulates the second ***gene*** attM. The latter encodes a homologue of N- ***acylhomoserine*** ***lactone*** (***AHL***)- ***lactonase*** . Mass spectrometry analysis shows that the enzyme encoded by attM is an ***AHL*** - ***lactonase*** that ***hydrolyzes*** the ***lactone*** ring of 3OC8HSL. In wild-type A. tumefaciens, attM expression is initially suppressed by AttJ but significantly elevated at the stationary phase accompanied a sharp decline in 3OC8HSL. DNA gel retardation analysis shows that AttJ specifically binds to the promoter that controls ***AHL*** - ***lactonase*** expression. Mutation of attJ resulted in constitutive production of ***AHL*** - ***lactonase*** that abolishes 3OC8HSL accumulation and Ti plasmid transfer. These data suggest that A. tumefaciens has a sophisticated multicomponent quorum-sensing signal turnover system, allowing the cell to sense a change in growth and adjust cellular activities accordingly.

L5 ANSWER 16 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 9
ACCESSION NUMBER: 2002:295668 CAPLUS
DOCUMENT NUMBER: 137:29791
TITLE: Identification of quorum-quenching N-acyl homoserine lactonases from Bacillus species
AUTHOR(S): Dong, Yi-Hu; Gusti, Andi R.; Zhang, Qiong; Xu, Jin-Ling; Zhang, Lian-Hui
CORPORATE SOURCE: Institute of Molecular Agrobiology, National University of Singapore, Singapore, 117604, Singapore
SOURCE: Applied and Environmental Microbiology (2002), 68(4), 1754-1759
CODEN: AEMIDF; ISSN: 0099-2240
PUBLISHER: American Society for Microbiology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A range of gram-neg. bacterial species use N-acyl homoserine lactone (AHL) mols. as quorum-sensing signals to regulate different biol. functions, including prodn. of virulence factors. AHL is also known as an autoinducer. An autoinducer ***inactivation*** ***gene*** , ***aiiA*** , coding for an ***AHL*** ***lactonase*** , was ***cloned*** from a bacterial isolate, Bacillus sp. strain 240B1. Here we report identification of more than 20 bacterial isolates capable of enzymic inactivation of AHLs from different sources. Eight isolates showing strong AHL-inactivating enzyme activity were selected for a preliminary taxonomic anal. Morphol. phenotypes and 16S ribosomal DNA sequence anal. indicated that these isolates probably belong to the species Bacillus thuringiensis. Enzymic anal. with known Bacillus strains confirmed that all of the strains of B. thuringiensis and the closely related species B. cereus and B. mycoides tested produced AHL-inactivating enzymes but B. fusiformis and B. sphaericus strains did not. Nine genes coding for AHL inactivation were cloned either by functional cloning or by a PCR procedure from selected bacterial isolates and strains. Sequence comparison of the gene products and motif anal. showed that the gene products belong to the same family of AHL lactonases.

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 17 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 10
ACCESSION NUMBER: 2001:31654 CAPLUS
DOCUMENT NUMBER: 134:96283
TITLE: Cloning of a Bacillus autoinducer ***inactivation*** protein ***AiiA*** ***gene*** and its mutagenesis and expression for agricultural application
INVENTOR(S): Zhang, Lian-Hui; Dong, Yihu; Xu, Jinling
PATENT ASSIGNEE(S): Institute of Molecular Agrobiology of 1 Research Link, Singapore
SOURCE: PCT Int. Appl., 49 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001002578	A1	20010111	WO 1999-SG128	19991117
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
SG 91822	A1	20021015	SG 1999-3146	19990702
CA 2378153	AA	20010111	CA 1999-2378153	19991117
BR 9917419	A	20020402	BR 1999-17419	19991117
EP 1192256	A1	20020403	EP 1999-958619	19991117
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
TR 200103820	T2	20020521	TR 2001-200103820	19991117
JP 2003504028	T2	20030204	JP 2001-508350	19991117
RU 2236462	C2	20040920	RU 2002-102558	19991117
NZ 516516	A	20041029	NZ 1999-516516	19991117
AU 780185	B2	20050303	AU 2000-15948	19991117
NO 2001006397	A	20020221	NO 2001-6397	20011227

PRIORITY APPLN. INFO.: SG 1999-3146 A 19990702
WO 1999-SG128 W 19991117

AB Disclosed are a Bacillus autoinducer ***inactivation*** protein (***AiiA***) ***gene*** isolated from Bacillus sp. 240B1 capable of enzymic ***inactivation*** of N-acylhomoserine lactones, known as autoinducers (AIs), which are involved in the regulation of pathogenic ***gene*** expression in the plants. Sequence alignment indicates that AiiA contains a "HXHXDH" zinc-binding motif that is conserved in several groups of metallohydrolases. Site-directed mutagenesis showed that conserved aspartate and most histidine residues are required for AiiA activity. Expression of aiiA in transformed Erwinia carotovora strain SCG1 significantly reduces the release of AI, decreases extracellular pectolytic enzyme activities, and attenuates pathogenicity on potato, eggplant, Chinese cabbage, carrot, celery, cauliflower, and tobacco. These results indicate that the AI-inactivation approach represents a promising strategy for prevention of diseases in which virulence is regulated by AIs.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 18 OF 20 Elsevier BIOBASE COPYRIGHT 2005 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 2001146971 ESBIOBASE
TITLE: Quenching quorum-sensing-dependent bacterial infection by an N-acyl homoserine lactonase
AUTHOR: Dong Y.-H.; Wang L.-H.; Xu J.-L.; Zhang H.-B.; Zhang

X.-F.; Zhang L.-H.
CORPORATE SOURCE: L.-H. Zhang, Laboratory of Biosignals, Institute of Molecular Agrobiology, National University of Singapore, 117604 Singapore, Singapore.
E-mail: lianhui@ima.org.sg
SOURCE: Nature, (14 JUN 2001), 411/6839 (813-817), 28 reference(s)
CODEN: NATUAS ISSN: 0028-0836
DOCUMENT TYPE: Journal; Article
COUNTRY: United Kingdom
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Bacterial cells sense their population density through a sophisticated cell-cell communication system and trigger expression of particular ***genes*** when the density reaches a threshold. This type of ***gene*** regulation, which controls diverse biological functions including virulence, is known as quorum sensing. Quorum-sensing signals, such as acyl-homoserine lactones (AHLs), are the essential components of the communication system. AHLs regulate virulence ***gene*** expression in a range of plant and animal (including human) bacterial pathogens. ***AHL*** -producing tobacco restored the pathogenicity of an ***AHL*** -negative mutant of Erwinia carotovora. Different bacterial species may produce different AHLs, which vary in the length and substitution of the acyl chain but contain the same homoserine lactone moiety. Here we show that the acyl-homoserine ***lactonase*** (***AHL*** - ***lactonase***), a new enzyme from Bacillus sp., ***inactivates*** ***AHL*** activity by ***hydrolysing*** the lactone bond of AHLs. Plants expressing ***AHL*** - ***lactonase*** quenched pathogen quorum-sensing signalling and showed significantly enhanced resistance to E. carotovora infection. Our results highlight a promising potential to use quorum-sensing signals as molecular targets for disease control, thereby broadening current approaches for prevention of bacterial infections.

L5 ANSWER 19 OF 20 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
ACCESSION NUMBER: 2001:443330 BIOSIS
DOCUMENT NUMBER: PREV200100443330
TITLE: Quenching quorum sensing-dependent bacterial infection.
AUTHOR(S): Lian-Hui, Z. [Reprint author]
CORPORATE SOURCE: Institute of Molecular Agrobiology, National University of Singapore, Singapore, Singapore
SOURCE: Phytopathology, (June, 2001) Vol. 91, No. 6 Supplement, pp. S160. print.
Meeting Info.: Joint Meeting of the American Phytopathological Society, the Mycological Society of America, and the Society of Nematologists. Salt Lake City, Utah, USA. August 25-29, 2001. American Phytopathological Society; Mycological Society of America; Society of Nematologists.
CODEN: PHYTAJ. ISSN: 0031-949X.
DOCUMENT TYPE: Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LANGUAGE: English
ENTRY DATE: Entered STN: 19 Sep 2001
Last Updated on STN: 22 Feb 2002
AB Bacterial cells sense their population density via a sophisticated cell-cell communication system, and trigger expression of particular genes when the density reaches a threshold. This type of gene regulation, which controls diverse biological functions including virulence, is known as quorum sensing. Quorum-sensing signals, such as acyl-homoserine lactones (AHLs), are the essential components of the systems. AHLs regulate virulence gene expression in a range of plant and animal (including human) bacterial pathogens. It appears that single-celled bacterial pathogens use quorum-sensing signals to synchronize virulence gene expression among family members as a concerted means to overwhelm host defenses. Quorum-sensing system thus represents a fascinating target for development of novel antipathogenic approaches. Recently, we showed that the ***aiiA*** ***gene*** from a gram-positive Bacillus sp. 240B1 encoded an enzyme capable of ***inactivating*** several AHLs. To test

the feasibility of establishing a generic "quorum quenching" approach to control bacterial infection, i.e., to paralyze quorum-sensing systems of bacterial pathogens via inactivation of quorum-sensing signals, we have tested the effect of AiiA on different AHL signals, and introduced aiiA to potato and tobacco plants. The results on characterization of AiiA inactivation of AHL signals and the effect of the enzyme on bacterial infection will be presented.

L5 ANSWER 20 OF 20 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 12
ACCESSION NUMBER: 2000:231970 CAPLUS
DOCUMENT NUMBER: 133:14397
TITLE: AiiA, an enzyme that inactivates the acylhomoserine lactone quorum-sensing signal and attenuates the virulence of Erwinia carotovora
AUTHOR(S): Dong, Yi-Hu; Xu, Jin-Ling; Li, Xian-Zhen; Zhang, Lian-Hui
CORPORATE SOURCE: Institute of Molecular Agrobiology, 1 Research Link, The National University of Singapore, Singapore, 117604, Singapore
SOURCE: Proceedings of the National Academy of Sciences of the United States of America (2000), 97(7), 3526-3531
CODEN: PNASA6; ISSN: 0027-8424
PUBLISHER: National Academy of Sciences
DOCUMENT TYPE: Journal
LANGUAGE: English
AB N-acylhomoserine lactones, known as autoinducers (Als), are widely conserved signal mols. present in quorum-sensing systems of many Gram-neg. bacteria. Als are involved in the regulation of diverse biol. functions, including expression of pathogenic genes in the plant pathogens Pseudomonas solanacearum, several Erwinia species, and the human pathogen Pseudomonas aeruginosa. A bacterial isolate, Bacillus sp. 240B1, is capable of enzymic inactivation of Als. The ***gene*** (***aiiA***) for Al ***inactivation*** from Bacillus sp. 240B1 has been ***cloned*** and shown to encode a protein of 250 amino acids. Sequence alignment indicates that AiiA contains a "HXHXDH" zinc-binding motif that is conserved in several groups of metallohydrolases. Site-directed mutagenesis showed that conserved aspartate and most histidine residues are required for AiiA activity. Expression of aiiA in transformed Erwinia carotovora strain SCG1 significantly reduces the release of Al, decreases extracellular pectolytic enzyme activities, and attenuates pathogenicity on potato, eggplant, Chinese cabbage, carrot, celery, cauliflower, and tobacco. Our results indicate that the Al-inactivation approach represents a promising strategy for prevention of diseases in which virulence is regulated by Als.
REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d his

L1 QUE (N-ACYLHOMOSERINE(S) LACTONE(S) ACYLASE#) OR (ACYLHOMOSERIN

FILE 'NLDB, PROMT, CAPLUS, EMBASE, BIOSIS, MEDLINE, SCISEARCH, TOXCENTER, ESBIOBASE, USPATFULL, LIFESCI, AGRICOLA, DRUGU' ENTERED AT 16:12:44 ON 26 SEP 2005
L2 976 S L1
L3 148 S (GENE# OR SEQUENCE# OR POLYNUCLEOTIDE# OR CLONE# OR RECOMBINA
L4 53 S (INACTIV? OR HYDROL?)(S) L3
L5 20 DUP REM L4 (33 DUPLICATES REMOVED)

=> log y

NiceZyme View of ENZYME: EC 3.5.1.14

Official Name

Aminoacylase.

Alternative Name(s)

Acylase I.

Aminoacylase I.

Benzamidase.

Dehydropeptidase II.

Hippuricase.

Histozyme.

Reaction catalysed

An N-acyl-L-amino acid + H(2)O <=> a carboxylate + an L-amino acid

Comment(s)

- Wide specificity; also hydrolyzes dehydropeptides.
- Used in separating D- and L-amino acids.

Cross-references

PROSITE	PDOC00613
BRENDA	3.5.1.14
PUMA2	3.5.1.14
PRIAM enzyme-specific profiles	3.5.1.14
Kyoto University LIGAND chemical database	3.5.1.14
IUBMB Enzyme Nomenclature	3.5.1.14
IntEnz	3.5.1.14
MEDLINE	Find literature relating to 3.5.1.14
UniProtKB/Swiss-Prot	Q03154, ACY1_HUMAN; P37111, ACY1_PIG; P37112, AMAA_BACST, P37356, AMAA_BACTR;

View entry in original ENZYME format

All UniProtKB/Swiss-Prot entries referenced in this entry, with possibility to download in different formats, align etc.
All ENZYME / UniProtKB/Swiss-Prot entries corresponding to 3.5.1.-

ENZYME: 3.5.1.14

Help

Entry	EC 3.5.1.14	Enzyme
Name	aminoacylase; dehydropeptidase II; histozyme; hippuricase; benzamidase; acylase I; hippurase; amido acid deacylase; L-aminoacylase; acylase; aminoacylase I; L-amino-acid acylase; alpha-N-acylaminoacid hydrolase; long acyl amidoacylase; short acyl amidoacylase	
Class	Hydrolases Acting on carbon-nitrogen bonds, other than peptide bonds In linear amides	
Sysname	N-acyl-L-amino-acid amidohydrolase	
Reaction	An N-acyl-L-amino acid + H2O = a carboxylate + an L-amino acid [RN:R00669 R01263]	
Substrate	N-acyl-L-amino acid [CPD:C02850] H2O [CPD:C00001]	
Product	carboxylate [CPD:C00060] L-amino acid [CPD:C00151]	
Comment	Wide specificity; also hydrolyses dehydropeptides. Used in separating D- and L- amino acids	
Pathway	PATH: map00220 Urea cycle and metabolism of amino groups	
Ortholog	KO: K01436 aminoacylase	
Genes	HSA: 95(ACY1) MMU: 109652(Acy1) DRE: 393970 DME: CG17109-PA(Dmel_CG17109) CG17110-PA(Dmel_CG17110) CG6733-PA(Dmel_CG6733) CEL: C10C5.3 C10C5.4 C10C5.5 ATH: At1g44180(T7O23.14) At1g44820(T12C22.9) At4g38220(F20D10.340) CME: CMA011C DDI: DDB0201767 TCR: 506363.70 506363.80 506363.90 506975.30 506975.40 ECO: b1337(abgB) SSN: SSO_1793(ydaJ) FTU: FTT1191 REU: Reut_A1358 BME: BMEI0033 BMEI0034 BMEI1827 GOX: GOX1176 GOX2239 BAN: BA1392(amaA) BAR: GBAA1392(amaA) BAA: BA_1294 BA_1916 BAT: BAS0672 BAS1289	

BCE: BC0701 BC1374 BC3664
BCA: BCE0775 BCE1490(amaA) BCE3698(hipO)
BCZ: BCZK0616(amaA) BCZK1263(amaA) BCZK2908(amaA) BCZK3370(amaA)
BTK: BT9727_0616(amaA) BT9727_1261(amaA) BT9727_2973(amaA)
BT9727_2974 BT9727_3419
BLD: BLi04023
BCL: ABC0022 ABC1615 ABC1855 ABC2804
GKA: GK3242 GK3251
LPL: lp_3044(amd)
FNU: FN0590 FN0702 FN0703 FN1063
LIL: LA2674
LIC: LIC11318(amaA)
PMN: PMN2A_1190
TTH: TTC0133
PTO: PTO0772 PTO1086

Disease MIM: 104620 Aminoacylase-1

Motif PS: PS00758 [LIV]-[GALMY]-[LIVMF]-x-[GSA]-H-x-D-[TV]-[STAV]
PS: PS00759 [GSTAI]-[SANQ]-D-x-K-[GSACN]-x(2)-[LIVMA]-x(2)-[LIVMFY]-x(14,17)-[LIVM]-x-[LIVMF]-[LIVMSTAG]-[LIVMFA]-x(2)-[DNG]-E-E-x-[GSTN]

Structures PDB: 1Q7L 1YSJ

Reference
1
Birnbaum, S.M., Levintow, L., Kingsley, R.B. and Greenstein, J.P. Specificity of amino acid acylases. J. Biol. Chem. 194 (1952) 455-470.
2
Fones, W.S. and Lee, M. Hydrolysis of N-acyl derivatives of alanine and phenylalanine by acylase I and carboxypeptidase. J. Biol. Chem. 201 (1953) 847-856.
3
Park, R.W. and Fox, S.W. An acylase system related to the utilization of benzoylamino acids by Lactobacillus arabinosus. J. Biol. Chem. 235 (1960) 3193-3197.

Other DBs IUBMB Enzyme Nomenclature: 3.5.1.14
ExPASy - ENZYME nomenclature database: 3.5.1.14
ERGO genome analysis and discovery system: 3.5.1.14
BRENDA, the Enzyme Database: 3.5.1.14
CAS: 9012-37-7

LinkDB All DBs

=> Original format

DBGET integrated database retrieval system, GenomeNet